

**REMARKS**

Claims 1-46 are pending in the application. Claims 1, 18-24 and 41-46 have been amended. No new matter is introduced.

**Specification**

The Examiner has objected to the specification due to informalities. Specifically, the Examiner has suggested that the phrase "business refinement design phase" be replaced with "business design refinement phase". In accordance with the Examiner's suggestion, the specification has been amended on p. 16, line 6 and p. 17 line 23. Accordingly, the objections to the specification are believed to be overcome. No new matter has been introduced by the amendments to the Specification. Acceptance is respectfully requested.

**35 U.S.C. § 112 Rejection**

Claims 20, 23, 43 and 46 have been rejected under 35 U.S.C. § 112, first paragraph, as being indefinite. In particular, Claims 20, 23, 43 and 46 have been cited as being unclear with the use of the term "repeats".

Claims 20, 23, 43 and 46 as now amended further clarifies the term "repeats" by indicating what shall be repeated. Specifically, the foregoing amendment amends Claim 20 to recite "The method of claim 19,...performing steps d1, d2 and d3 so as to repeat the sensitivity analysis...". Likewise, Claims 23, 43 and 46 have been amended to recited specific steps or elements from intervening claims being repeated. Support for these amendments is found at least on Specification p. 20, lines 1-3 and p. 26, line 25 through p. 27, line 28, as originally filed. Further support can be found in Figures 10 and 13 as originally filed. No new matter is being introduced. Thus, Claims 20, 23, 43 and 46 as now amended are believed to meet the requisites of 35 U.S.C. § 112, first paragraph. As such the rejections under 35 U.S.C. § 112, first paragraph are believed to be overcome. Acceptance is respectfully requested.

Claims 1-19 have been rejected under 35 U.S.C. § 112, second paragraph as being indefinite. In particular, Claims 1-19 are cited as being incomplete for omitting essential steps where such omissions amount to a gap between steps.

With regard to Claim 1, page 5 of the Office Action states that additional steps are required in order for Claim 1 to recite a method for improving predictive modeling. However, only a part of Claim 1 has been cited. That is, the Examiner has omitted the following portion of the claim:

“...,the business layer modeling dynamic characteristics and behavior of the business components and the interactions among the business components in response to dynamic business workloads, such that a dynamic representation of the business solution results.”

This portion of Claim 1 does show how to improve predictive modeling by using a business layer for modeling. Therefore, Claim 1 does not omit essential steps. However, in the interest of expediting prosecution Applicant has amended Claim 1 for the purpose of clarity. Claim 1 now reads (in pertinent part):

“A computer implemented method for improved predictive modeling...comprising:  
... generating a predictive model of the information system comprising a business layer generated from the business solution description; and  
modeling dynamic characteristics and behavior of the business components and the interactions among the business components using the business layer, in response to dynamic business workloads, such that a dynamic representation of the business solution results.”

With regard to Claim 18, page 6 of the Office Action states that “...performing a sensitivity analysis on individual component models does not improve the accuracy of a predictive model of an information system.” Applicant believes that a sensitivity analysis can and does improve the accuracy of a predictive model of an information system as described on Specification p. 3, line 25 through p. 4, line 4. That passage describes one embodiment. Other embodiments are envisioned with Claim 18. For the purpose of clarity, Claim 18 is now amended to recite the sensitivity analysis “...providing an assessment of accuracy of the predictive model in a manner enabling improvement of accuracy...”.

Accordingly, Claims 1-19 (where Claims 2-17 are dependent on Claim 1 and Claim 19 is dependent on Claim 18) are believed to particularly point out and distinctly claim the subject matter which Applicant regards as their invention in satisfaction of 35 U.S.C. § 112 second paragraph. Acceptance is respectfully requested.

Claims 24-42 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. In particular, Claims 24-42 are cited as being incomplete for omitting essential steps where such omissions amount to a gap between steps.

With regard to Claim 24, page 8 of the Office Action states that additional elements are required in order for Claim 24 to provide a system for improving a predictive model. Similar to Claim 1, the Examiner has only cited Claim 24 in part. That is, the Examiner has omitted the following portion of the claim:

“...the business layer modeling dynamic characteristics and behavior of the business components and the interactions among the business components in response to dynamic business workloads, such that a dynamic representation of the business solution results.”

This portion of Claim 24 does show how to improve predictive modeling by using a business layer for modeling. Therefore, Claim 24 does not omit essential steps. However, in the interest of expediting prosecution Applicant has now amended Claim 24 for the purpose of clarity.

Claim 24 now reads:

“A system for improved predictive modeling...comprising:  
... the construction module generating a predictive model of the information system comprising a business layer generated from the business solution description[[]]; and  
the business layer modeling dynamic characteristics and behavior of the business components and the interactions among the business components in response to dynamic business workloads, such that a dynamic representation of the business solution results.”

With regard to Claim 41, page 9 of the Office Action states that “performing a sensitivity analysis on individual component models does not improve the accuracy of a predictive model of an information system.” Applicant believes that the sensitivity analysis does improve the accuracy of a predictive model of an information system, as argued above. The Specification, as originally filed, on p. 3, line 25 through p. 4, line 4 discloses how a sensitivity analysis in one

embodiment improves the accuracy of a predictive model of an information system. Claim 41 is now amended to generically state how the sensitivity analysis improves accuracy of a predictive model, similar to the claim amendments of Claim 18. Thus, the rejection of Claim 41 is believed to be overcome.

Accordingly, Claims 24-42 (where Claims 25-40 are dependent on Claim 24 and Claim 42 is dependent on Claim 41) are believed to particularly point out and distinctly claim the subject matter which Applicant regards as their invention in satisfaction of 35 U.S.C. § 112, second paragraph. Acceptance is respectfully requested.

#### 35 U.S.C. § 101 Rejection

Claims 1-20 and 24-43 have been rejected under 35 U.S.C. § 101. In support of this rejection, the Office Action states the claimed invention is directed to non-statutory subject matter.

In accordance with the Examiner's proposed amendments, base Claims 1, 18, 24 and 41 have now been amended to clarify the subject matter of the claimed invention. The Office Action states that none of the limitations of Claim 1, 18, 24 or 41 are directed to the technological arts. Following the Examiner's proposed language, base Claims 1 and 18 have now been amended to recite a "computer-implemented method" and base Claims 24 and 41 have been amended to recite computer system hardware and software components. As such, these base claims and all dependent claims are directed to the technological arts. No new matter has been introduced. Acceptance is respectfully requested. Accordingly, the rejection under 35 U.S.C. § 101 is believed to be overcome.

#### 35 U.S.C. § 102 Rejection

Claims 1-15, 17-20, 24-38 and 40-43 have been rejected under 35 U.S.C. 102(e) as being anticipated by McDonald et al. (U.S. Patent 5,881,268) hereafter "McDonald".

As used in the present invention, an "information system" typically includes a computer system architecture, distributed software applications, various system hardware (clients, servers, data stores) and system networking components. During the design and implementation of information systems, traditional system engineering typically proceeds through several

development phases from conception through deployment. However, there are no checkpoints to determine whether the design or implementation will satisfy a set of predefined business or technical performance criteria. Therefore it is the job of the "information system" to implement business solutions by providing a technical infrastructure that supports the business workload, business processes, and data storage requirements of the solution. Business solutions involve interactions among business components, including business workloads, business processes, and data stores, to solve the needs of business entities. Generally, the design of such information systems are constrained by a set of business requirements, which predefine certain performance criteria to make the business solution acceptable. (Specification, p. 6 lines 1-7).

The present invention further provides a system and method for improving the accuracy of a predictive model of an information system through automated calibration of the predictive model against predefined performance benchmarks. In particular, a construction module generates a predictive model of an information system including a business layer, an application layer, and a system layer with each layer modeling dynamic characteristics and behavior of one or more components. A performance metric calculation module calculates individual performance metrics for each component modeled in the application and system layers from the dynamic characteristics and behavior. The construction module, in turn, compares the calculated individual performance metrics against predefined individual performance benchmarks to assess the accuracy of the predictive model. For component models that do not substantially match a corresponding performance benchmark, the construction module performs a sensitivity analysis on individual component models. (Specification, p. 3 lines 12 - 24).

McDonald does not deal with the designing of an information system as in the claimed invention. Instead, McDonald is directed to software application/program design. McDonald describes a tool and method that helps identify an optimum software application/program design for an existing distributed processing environment. The disclosed tool provides a performance analysis for comparing various application program design alternatives and for determining optimal distribution of objects prior to writing or generating the program code. The tool of McDonald allows the user (application developer) to define different parameters of the application and distributed system and then analyze the new resource demands for each process of the distributed processing system. (Col. 2, lines 58 - 67.) In this way, McDonald provides

performance projections for designs of an application over a known distributed processing system. (Col. 3, lines 1 - 23.)

In McDonald, the user makes entries to specify, among various known characteristics, hardware configuration (known set), the performance specifications of the application and target distribution system. (Fig. 3, block 42, Col. 4, lines 33-54, and Col. 5, lines 48-55.) The performance model is constructed from the user's specification.

In contrast, the present invention allows a user to input proposed design description and desired performance metrics of an information system not yet in existence (i.e., being developed/created). The invention system receives this descriptive input and transforms the descriptive input into quantitative data used for design of the proposed (not yet existing) information system. The output module outputs an initial design of the proposed information system meeting the input descriptive specifications and outputs an additional system design as an alternative. The present invention further provides a predictive model of the information system under design. Thus, the present invention is not limited to the designing of an application program on an existing distributed processing system and determining an optimum program design relative to all the tested ones as in McDonald. That is, the present invention analyzes different system elements and whole system designs for purposes of developing (i.e., creating and designing) a desired (not in existence) information system. Such creating and designing of an information system and a tool for assisting such of the present invention is not implied or disclosed by McDonald *et al.*

A prima facie case of anticipation requires, at a minimum, that the cited art teach every feature of the claims. When, as here, the reference does not teach a feature of the claim, a prima facie case of anticipation has not been established. McDonald has not been shown to teach “... *generating a predictive model of the information system comprising a business layer generated from the business solution description; and modeling dynamic characteristics and behavior of the business components and the interactions among the business components using the business layer, in response to dynamic business workloads, such that a dynamic representation of the business solution results*” as recited in base Claims 1 and 24 as now amended. Similarly, McDonald has not been shown to teach “*generating a predictive model of an information system comprising a business layer, an application layer, and a system layer, each layer modeling*

*dynamic characteristics and behavior of one or more components...and performing a sensitivity analysis...providing an assessment of accuracy of the predictive model in a manner enabling improvement of accuracy of the predictive model.*”, as recited in base Claims 18 and 41 as now amended. Dependent Claims 2-15, 17, 19-20, 25-38, 40 and 42-43 inherit and include similar claim features (limitations). Thus, all the pending claims are patentably distinct over the cited reference. Withdrawal of the § 102(e) rejection of these claims is respectfully requested.

### 35 U.S.C. § 103 Rejection

Claims 16 and 39 have been rejected under 35 U.S.C. 103(a) as being unpatentable over McDonald and in view of Bannon et al. (U.S. Patent 5,297,279) , hereafter “Bannon”, and further in view of Gloudeman et al. (U.S. Patent 6,119,125) hereafter “Gloudeman”.

Bannon provides a system and method for database management for providing support for long-term storage and retrieval of objects created by application programs written in object-oriented programming languages. The Bannon system consists of four software modules that provide database services to application developers. These modules provide data definition language translation (DDL), object management (OMS), object translation (OTS), and persistent object storage service (POS server). Such system allows an application program to retrieve persistent objects from the database. In a C++ embodiment, application developers interact solely with the data definition language module (DDL) in a batch processing mode. The application developers interact with the object management module (OMS) using standard C++ syntax in their application programs. (See Abstract, Col. 6, lines 36-43, Col. 6, line 67 through Col. 7, line 8, and Col. 7, lines 47-50.) Neither the data definition language module (DDL) nor the object management module (OMS) of Bannon imply or suggest the “...modeling dynamic characteristics and behavior of the business components” in a predictive model of an information system of the claimed invention.

Gloudeman provides a computer software architecture that supports object-oriented system development. In the object-oriented paradigm, standard objects are the fundamental building block used to construct an application. Based on predetermined physical relationships defined by physical laws associated with building automation functions, the Gloudeman system

defines a fundamental set of control-based standard objects for constructing an application. An additional set of information-type standard objects are also defined for use in conjunction with the set of control-based standard objects. Information is communicated by passing messages between these standard objects. (See Abstract, Col 6, lines 11-33.) Gloudeman provides a object-oriented system architecture to aide in application development, however, this type of support tool is not generating a predictive model of an information system in contrast to the present invention.

Neither Bannon nor Gloudeman, separately or together, add to McDonald the missing claim features of “... *generating a predictive model of the information system comprising a business layer generated from the business solution description; and modeling dynamic characteristics and behavior of the business components and the interactions among the business components using the business layer, in response to dynamic business workloads, such that a dynamic representation of the business solution results*”. See base Claims 1 and 24 as now amended. Further, none of these references are directed to modeling an information system as in the present invention. So, even if combined, these references do not speak to the same art area as the present invention.

Thus, no combination of McDonald, Bannon and/or Gloudeman imply, suggest or make obvious the claimed process or system as claimed in base Claims 1 and 24. Claim 16 depends from base Claim 1 and Claim 39 depends from base Claim 24 and thus inherit these claim limitations. Thus, the § 103(a) rejection of Claims 16 and 39 as being unpatentable over McDonald in view of Bannon and further in view of Gloudeman is believed to be overcome. Acceptance is respectfully requested.

Claims 21-23 and 44-46 have been rejected under 35 U.S.C. 103(a) as being unpatentable over McDonald and in view of Peterson et al. (U.S. Patent 6,327,551) hereafter “Peterson”.

Peterson provides a system for designing product specifications for a multitude of products. This system employs a user centered approach which begins with a usage specification. The usage specification is defined by a user input series of goals, constraints and performance characteristics. From the usage specification, further specifications (e.g., conceptual



specification, functional specification, interface specification and device specification) are developed. From the number of specifications, representations of varying degrees of abstraction and detail together with corresponding prototypes can be produced. Prototyping, validation and verification can be utilized at specific stages of the design process. (Col. 6, lines 22-45, Col 7, lines 3-22.) The result of this system is a final design specification that can be used for implementation of the product. In this way, Peterson enables a user to generate a design specification *prior* to implementation of the desired product. (See Abstract.)

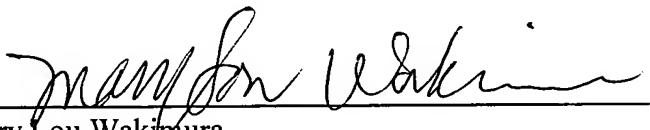
Peterson does not add to McDonald the missing claim feature of “*generating a predictive model of an information system comprising a business layer, an application layer, and a system layer, each layer modeling dynamic characteristics and behavior of one or more components...and performing a sensitivity analysis...providing an assessment of accuracy of the predictive model...*”. Thus, neither McDonald nor Peterson in any combination imply, suggest or make obvious the claimed process or system as claimed in base Claims 18 and 41. Claims 21-23 depend from base Claim 18 and Claims 44-46 depend from base Claim 41 and thus inherit these claim limitations. Accordingly, the § 103(a) rejection of Claims 21-23 and 44-46 as being unpatentable over McDonald in view of Peterson is believed to be overcome. Acceptance is respectfully requested.

**CONCLUSION**

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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